

REMARKS

Applicant requests reconsideration of the present application in view of the foregoing amendment and the discussion that follows. The status of the claims is as follows. Claims 1-39 were originally filed and are currently pending as are claims 40-62, which were added previously. Claims 22-39 were withdrawn from consideration and these claims were canceled previously without prejudice to Applicant's filing of divisional applications to what has been determined to be the separately patentable subject matter thereof. Claims 57 and 58 have been canceled herein and claims 1, 8, 41, 47, 54, 55 and 59 have been amended herein.

The Amendment

The specification was amended to correct a typographical error. The amendment finds support in the specification, for example, Fig. 2.

Claim 1 was amended to recite that the chamber comprises a gas outlet in a wall thereof that is perpendicular to said gas inlets. Support therefor is in the specification, for example, Fig. 2.

Claim 8 was amended to recite that each gas inlet comprises a separate T-junction such that gas enters each of the gas inlets in a direction that is substantially normal to the direction in which gas exits the manifold. Support therefor is in the specification, for example, Fig. 1, page 8, lines 28-33 and the paragraph bridging pages 15 and 16.

Claim 41 was amended to recite that the gas inlet source is oriented to provide gas from two directions so that gas from each direction collides and enters the gas inlet. Support therefor is in the specification, for example, page 16, lines 23-26.

Claim 54 was amended to recite a pulse jet dispensing device. Support therefor is in the specification, for example, page 24, last line.

Claim 55 was amended to recite that the chamber has vertical symmetry to provide proper reference back to claim 54, from which claim 55 depends. Support therefor is in the specification, for example, original claim 10.

Claims 47 and 59 were amended to correct a typographical error. Claim 59 was also amended to provide proper reference back to claim 54, from which claim 59 depends.

The Drawings

Applicant acknowledges the indication in the Office Action that the formal drawings provided previously have been accepted.

Rejection under 35 U.S.C. §112

Applicant believes that the amendments to claims 55 and 59 obviate the rejections of those claims under the first paragraph of the above code section.

Applicant submits that the amendment to claim 8 obviates the rejection of claim 8 under the second paragraph of the above code section. Fig. 1 and the accompanying discussion in the specification in the paragraph bridging pages 15 and 16 clearly describe the situation where gas enters the gas inlets of the compartments in a direction that is substantially normal to the direction in which gas exits the manifold. The specification describes an exemplary apparatus 20 that comprises four gas source lines 22a-22d. Each of gas source lines 22a-22d is in fluid communication with one of junctions 24a-24d, respectively. Also in fluid communication with junctions 24a-24d are opposing gas lines 26a and 28a, 26b and 28b, 26c and 28c, and 26d and 28d respectively. In this way gas entering each of junctions 24a-24d is opposed and directed down gas source lines 22a-22d, respectively, in a direction normal to the flow of gas into each of junctions 24a-24d. Such a situation tends to reduce gas velocity as the gas enters each of compartments 34a-34d, respectively, of manifold 34. The discussion in the Office Action concerning Fig. 2 is not relevant because Fig. 2 is directed to an exemplary embodiment that is different from that of Fig. 1 as clearly set forth in the specification.

Rejection under 35 U.S.C. §103

Claims 1-3, 5, 7-10, 12-20 and 40 were rejected under 35 U.S.C. 103(a) as being unpatentable over Wagener, *et al.* (U.S. Patent No. 6,251,195) (Wagener) in view of Sharma, *et al.* (U.S. Patent No. 5,195,888) (Sharma).

The Office Action acknowledges that Wagener is silent as to the “diffuser 32” of the reference comprising a manifold including at least two compartments, wherein each of the compartments is in fluid communication with a respective gas inlet, wherein a perforated element is in fluid communication with the manifold, and wherein one or more elements for diffusing gas is located within each compartment.

While the Office Action recognizes that Wagener does not teach or suggest the perforated element of claim 1, the Office Action refers to Sharma as teaching an apparatus for dispersing a gas as a multi-layer fluid curtain, wherein the apparatus comprises a manifold including at least two compartments, wherein each of the compartments is in fluid communication with a respective gas inlet. The Office Action further alleges that Sharma discloses a perforated element in fluid communication with the manifold and identifies each of emitting areas 20 and 26 comprising an "opening covered by a porous, permeable or perforated surface," (referring to column 4, lines 17-33 and 47-66, of the reference in support thereof). The Office Action further contends that the perforated element is substantially perpendicular to the gas inlets 18 and 24 and refers to emitting area 26 as perpendicular to inlet 24 in FIG. 1. Also, asserts the Office Action, emitting area 20 may be, "oriented to emit the inner layer of fluid parallel to the furnace opening 10," thereby suggesting that the element may also be configured perpendicular to the gas inlet 18.

The Office Action contends that it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute the apparatus for dispersing gas of Sharma for the diffuser 32 in the apparatus of Wagener, on the basis of suitability for the intended use, because the fluid curtain as emitted by the apparatus of Sharma possesses two layers that act cooperatively to stabilize the laminar flow in each layer over a longer distance, thereby extending the effective area of coverage of the layers (the Office Action refers to column 2, lines 41-50, of Sharma). Also, asserts the Office Action, the substitution of known equivalent structures involves only ordinary skill in the art.

First, Sharma is concerned with furnaces such as a metal melting furnace, e.g., an electric induction furnace. Although the patentee indicates that the invention has many applications for providing a selected atmosphere within a contained volume, the disclosure of the reference does not extend beyond metal melting furnaces. One skilled in the art, in developing improvements on an apparatus for transferring a microelectronic device to and from a processing chamber and the use of cryogenic fluids in the processing chamber such as disclosed by Wagener would not look to Sharma for relevant information.

Second, assuming for the sake of argument, the skilled artisan would look to Sharma, an assumption that Applicant does not accept, the resulting combination of teachings does not yield the presently claimed invention. Neither of the references

discloses or suggests, either individually or in combination, the feature of claim 1 where the chamber comprises a gas outlet in a wall thereof that is perpendicular to said gas inlets. Wagener's employs a vacuum pump 40 and an equalization port 48 to control the environment of his chamber, which the patentee refers to as having a sealable interior space 14. Sharma is also silent on such a feature. Sharma shows only furnace opening 10 that is not in a wall that is perpendicular to fluid inlet 24.

Furthermore, the contention in the Office Action that emitting area 20 may be, "oriented to emit the inner layer of fluid parallel to the furnace opening 10," thereby suggesting that the element may also be configured perpendicular to the gas inlet 18, is not persuasive. As a matter of fact, Sharma states that the inner diffuser 16 may be oriented to emit the inner layer of fluid parallel to the furnace opening 10 or the inner diffuser 16 may be oriented to direct the layer into the furnace opening 10 and states further that, in FIG. 1, the porous faces 20 of inner diffusers 16 are oriented to emit fluid layers into the opening 10, and Sharma further states that an acute angle of up to 30 degrees into the opening is useful. Such an angle disclosed in the reference is not suggestive of a substantially perpendicular relationship.

Another point is that the substitution of elements asserted in the Office Action goes beyond the mere substitution of one element for another element. One skilled in the art would have to carry out undue experimentation in order to try to operably incorporate the diffuser of Sharma into the apparatus of Wagener. There is nothing in either reference that would assist the skilled artisan in making such the substitution asserted in the Office Action.

Claims 2 and 3 depend from claim 1 and, thus, are patentable over the combined teachings of the references by virtue of their respective dependency from claim 1, which is patentable over the references as demonstrated above.

The Office Action asserts, with respect to claim 5, that Wagener discloses that diffuser 32 can be positioned in a number of locations within chamber 12 as may be desired for a particular application and that diffuser 32 may be adjustably mounted within the chamber 12. Thus, contends the Office Action, it would have been obvious for one of ordinary skill in the art at the time the invention was made to locate the diffuser opposite the opening 28 in the modified apparatus of Wegner on the basis of suitability for the intended use. Furthermore, argues the Office Action, the shifting of location of parts merely involves routine skill in the art.

Applicant respectfully traverses this rejection. Furthermore, Applicant points out in the specification that gas flow, which is substantially perpendicular to the wall of the chamber comprising the gas outlet, does not stagnate or recirculate (page 16, last sentence, for example). This substantially perpendicular flow is realized by the structural relationship of the elements of the present apparatus.

Regarding claims 7 and 40, the Office Action contends that device 20 for dispensing reagents 24 is a drop dispensing device and that device 20 also comprises a pulse jet device since the device is capable of supplying a jet of cryogenic particles. Such a contention is unsupported by any reference. Device 20 of the reference is not a pulse jet device simply because device 20 supplies a jet of cryogenic particles. The Office Action further asserts that, in any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select a known, suitable dispensing device for the device 20 in the modified apparatus of Wagener on the basis of suitability for the intended use and takes "Official Notice" that the instantly claimed dispensing devices are conventionally known in the art. The issue is not whether such devices are known in the art. Applicant submits that one skilled in the art would not be inclined to substitute a pulse jet device for the aerosol device of Wagener. A pulse jet device would not function in the manner necessary for Wagener's apparatus to work properly because Wagener requires an aerosol spray, not pulsed drops of fluid.

The Office Action recognizes that the collective teaching of Wagener and Sharma is silent as to the instantly claimed orientation of the gas inlets. However, asserts the Office Action, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate orientation for the gas inlets in the modified apparatus of Wagener, on the basis of suitability for the intended use, because the shifting of location of parts merely involves routine skill in the art.

Applicant respectfully traverses this ground of rejection. The claim recites that the each gas inlet comprises a separate T-junction such that gas enters each of the gas inlets in a direction that is substantially normal to the direction in which gas exits the manifold. In this manner Applicant achieves a result wherein gas is introduced into the gas inlet from both sides of the junction in such a manner that the gas flow from each side is in opposition to slow the gas before it enters the gas inlet on its way to the compartments of the manifold. This enhances energy dissipation of the

gas within the compartments of the manifold. The combined teachings of the references do not disclose or suggest such a feature and such a feature does not involve mere shifting of location of parts.

Without acquiescing in the position of the Office Action regarding claims 9, 10 and 12-20, these claims depend ultimately from claim 1 and, thus, are patentable over the combined teachings of the references by virtue of their respective dependency from claim 1, which is patentable over the references as demonstrated above.

Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Wagener in view of Sharma, as applied to claim 1 above, and further in view of Vogel (U.S. Patent No. 5,590,537). Without acquiescing in the position of the Office Action, Applicant has demonstrated above that claim 1, from which claim 4 depends, is patentable over the combined teaching of Wagener and Sharma. Vogel does not cure the deficiencies of those references and, thus, claim 4 is patentable over the combined teachings of Wagener, Sharma and Vogel by virtue of its dependency from claim 1.

Claims 6 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Wagener in view of Sharma, as applied to Claim 1 above, and further in view of Yamamoto (JP 63-296845). Without acquiescing in the position of the Office Action, Applicant has demonstrated above that claim 1, from which claims 6 and 11 depend, is patentable over the combined teaching of Wagener and Sharma. Yamamoto does not cure the deficiencies of those references and, thus, claims 6 and 11 are patentable over the combined teachings of Wagener, Sharma and Yamamoto by virtue of their dependency from claim 1. Furthermore, Yamamoto is concerned with whirlwind-type draft chambers and one skilled in the art would not look to Yamamoto for information relating to apparatus for providing an evenly distributed flow of gas as in Wagener or a laminar flow of fluid such as in Sharma.

Claim 21 was rejected under 35 U.S.C. 103(a) as being unpatentable over Wagener in view of Sharma, as applied to claim 1 above, and further in view of Philipossian (U.S. Patent No. 5,064,367).

The Office Action recognizes that the collective teaching of Wagener and Sharma is silent as to each compartment comprising an element for diffusing gas within the compartment. However, asserts the Office Action, Philipossian teaches a compartment (i.e., asserts the Office Action, tube 10) comprising a diffusing element

(i.e., asserts the Office Action, as defined by filler 45, or insert 46). It would have been obvious for one of ordinary skill in the art at the time the invention was made, contends the Office Action, to provide a diffusing element within the compartments in the modified apparatus of Wagener, on the basis of suitability for the intended use, because the diffusing elements produce a conical nozzle that supplies a gas flow at faster velocities, following the flow streamlines, and avoids or minimizes recirculating gas cells; the amount of gas used in purging a tube with this configuration is reduced, and the time needed for thorough purging is also reduced.

Applicant respectfully traverses this ground of rejection. First, Sharma is concerned with furnaces such as a metal melting furnace, e.g., an electric induction furnace. Although the patentee indicates that the invention has many applications for providing a selected atmosphere within a contained volume, the disclosure of the reference does not extend beyond metal melting furnaces. One skilled in the art, in developing improvements on an apparatus for transferring a microelectronic device to and from a processing chamber and the use of cryogenic fluids in the processing chamber such as disclosed by Wagener would not look to Sharma or Philipossian for relevant information.

Second, claim 21 depends ultimately from claim 1, which is patentable over the combined teaching of Wagener and Sharma as demonstrated above. Philipossian does not cure the deficiencies of those references and, thus, claim 21 is patentable over the combined teachings of Wagener, Sharma and Philipossian by virtue of its dependency from claim 1.

Claims 41, 43, 45-48 and 50-52 were rejected under 35 U.S.C. 103(a) as being unpatentable over Wagener in view of Sharma and Powers (U.S. Patent No. 5,965,048).

The Office Action presents essentially the same arguments for combining the teachings of Wagener and Sharma as presented for the rejection of claim 1 over Wagener and Sharma. These arguments were addressed above. The Office Action recognizes that the collective teaching of Wagener and Sharma is silent as to each gas inlet being in fluid communication with a gas inlet source that is oriented to provide gas in a direction that is substantially normal to the direction in which the gas flows through the gas inlet and enters the manifold. However, the Office Action refers to Powers as teaching an apparatus comprising plural gas inlets, wherein each gas inlet 64 is in fluid communication with a gas inlet source that is oriented to

provide gas in a direction that is substantially normal to the direction in which the gas flows through the gas inlet and into the diffuser (i.e., asserts the Office Action, via conduit 44, which directs the gas flow in a direction normal to the flow of gas through gas inlets 64). It would have been obvious for one of ordinary skill in the art at the time the invention was made, contends the Office Action, to configure the gas inlets as instantly claimed because the configuration allows plural gas inlets to be fed by a single gas source, as taught by Powers.

First, Sharma is concerned with furnaces such as a metal melting furnace, e.g., an electric induction furnace. Although the patentee indicates that the invention has many applications for providing a selected atmosphere within a contained volume, the disclosure of the reference does not extend beyond metal melting furnaces. One skilled in the art, in developing improvements on an apparatus for transferring a microelectronic device to and from a processing chamber and the use of cryogenic fluids in the processing chamber such as disclosed by Wagener would not look to Sharma for relevant information. Furthermore, since Powers is concerned with heating chambers, one skilled in the art would not look to Powers for a teaching to combine with Sharma.

Second, claim 41 recites that each gas inlet is in fluid communication with a gas inlet source that is oriented to provide gas from two directions so that gas from each direction collides and enters said gas inlet in a direction that is substantially normal to the direction in which the gas flows through the gas inlets and enters the manifold. Therefore, even if the combination of teachings of Wagener, Sharma and Powers were made as alleged in the Office Action, one still would not be in possession of the apparatus of claim 41. None of the references teaches or suggests the type of gas inlet that provides gas from two directions so that gas from each direction collides and enters the gas inlet in a direction that is substantially normal to the direction in which the gas flows through the gas inlets. Whatever the nature of conduit 44 of Powers, it is evident that it is incapable of functioning as required in claim 41.

The Office Action asserts, with respect to Claim 43, that Wagener discloses that diffuser 32 can be positioned in a number of locations within chamber 12 as may be desired for a particular application and that diffuser 32 may be adjustably mounted within the chamber 12. Thus, contends the Office Action, it would have been obvious for one of ordinary skill in the art at the time the invention was made to

locate the perforated element opposite the opening 28 in the modified apparatus of Wegner on the basis of suitability for the intended use. Furthermore, argues the Office Action, the shifting of location of parts merely involves routine skill in the art.

Applicant respectfully traverses this rejection. Furthermore, Applicant points out in the specification that gas flow, which is substantially perpendicular to the wall of the chamber comprising the gas outlet, does not stagnate or recirculate (page 16, last sentence, for example). This result is achieved by the spatial relationship of the elements of Applicant's apparatus.

With regard to the rejection of claims 45-47, the Office Action appears to be making essentially the same arguments as those presented in the rejection of claims 7 and 40. The Office Action contends that device 20 of Wagener for dispensing reagents 24 is a drop dispensing device and that device 20 also comprises a pulse jet device since the device is capable of supplying a jet of cryogenic particles. Such a contention is unsupported by any reference. Device 20 is not a pulse jet device simply because device 20 supplies a jet of cryogenic particles.

The Office Action further asserts that, in any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select a known, suitable dispensing device for the device 20 in the modified apparatus of Wagener on the basis of suitability for the intended use and takes "Official Notice" that the instantly claimed dispensing devices are conventionally known in the art.

The issue is not whether such devices are known in the art. Applicant submits that one skilled in the art would not be inclined to substitute a pulse jet device for the aerosol device of Wagener. A pulse jet device would not function in the manner necessary for Wagener's apparatus to work properly because Wagener requires an aerosol spray.

Without acquiescing in the position of the Office Action regarding claims 48 and 50-52, these claims depend ultimately from claim 41 and, thus, are patentable over the combined teachings of the references by virtue of their respective dependency from claim 41, which is patentable over the references as demonstrated above.

Claim 42 was rejected under 35 U.S.C. 103(a) as being unpatentable over Wagener in view of Sharma and Powers, as applied to claim 41 above, and further in view of Vogel. Without acquiescing in the position of the Office Action, Applicant has

demonstrated above that claim 41, from which Claim 42 depends, is patentable over the combined teaching of Wagener and Sharma. Vogel does not cure the deficiencies of those references and, thus, claim 42 is patentable over the combined teachings of Wagener, Sharma and Vogel by virtue of its dependency from claim 41.

Claims 44 and 49 were rejected under 35 U.S.C. 103(a) as being unpatentable over Wagener in view of Sharma and Powers, as applied to claims 41 and 43 above, and further in view of Yamamoto. Without acquiescing in the position of the Office Action, Applicant has demonstrated above that claim 41, from which claims 44 and 49 depend, is patentable over the combined teaching of Wagener and Sharma. Yamamoto does not cure the deficiencies of those references and, thus, claims 44 and 49 are patentable over the combined teachings of Wagener, Sharma, Powers and Yamamoto by virtue of their dependency from claim 41. Furthermore, Yamamoto is concerned with whirlwind-type draft chambers and one skilled in the art would not look to Yamamoto for information relating to apparatus for providing an evenly distributed flow of gas as in Wagener or a laminar flow of fluid such as in Sharma.

Claim 53 was rejected under 35 U.S.C. 103(a) as being unpatentable over Wagener in view of Sharma and Powers, as applied to claim 41 above, and further in view of Philipossian. The Office Action recognizes that the collective teaching of Wagener and Sharma is silent as to each compartment comprising an element for diffusing gas within the compartment. However, asserts the Office Action, Philipossian teaches a compartment (i.e., contends the Office Action, tube 10) comprising a diffusing element (i.e., contends the Office Action) as defined by filler 45, or insert 46). It would have been obvious for one of ordinary skill in the art at the time the invention, contends the Office Action, was made to provide a diffusing element within the compartments in the modified apparatus of Wagener, on the basis of suitability for the intended use, because the diffusing elements produce a conical nozzle that supplies a gas flow at faster velocities, following the flow streamlines, and avoids or minimizes recirculating gas cells; the amount of gas used in purging a tube with this configuration is reduced, and the time needed for thorough purging is also reduced.

Applicant respectfully traverses this ground of rejection. First, Sharma is concerned with furnaces such as a metal melting furnace, e.g., an electric induction furnace. Although the patentee indicates that the invention has many applications for

providing a selected atmosphere within a contained volume, the disclosure of the reference does not extend beyond metal melting furnaces. One skilled in the art, in developing improvements on an apparatus for transferring a microelectronic device to and from a processing chamber and the use of cryogenic fluids in the processing chamber such as disclosed by Wagener would not look to Sharma or Philipossian for relevant information.

Second, claim 53 depends ultimately from claim 41, which is patentable over the combined teaching of Wagener and Sharma as demonstrated above. Philipossian does not cure the deficiencies of those references and, thus, claim 53 is patentable over the combined teachings of Wagener, Sharma and Philipossian by virtue of its dependency from claim 41.

Claims 54, 55 and 57-62 were rejected under 35 U.S.C. 103(a) as being unpatentable over Wagener in view of Sharma and Philipossian.

Regarding claim 54, the Office Action presents essentially the same arguments for combining the teachings of Wagener and Sharma as presented above with regard to the rejections of claims 1 and 41. The Office Action recognizes that the collective teaching of Wagener and Sharma is silent as to each of the compartments comprising raised surfaces within the compartments. However, asserts the Office Action, Philipossian teaches a compartment (i.e., contends the Office Action, tube 10) comprising raised surfaces (i.e., contends the Office Action, as defined by filler 45, or insert 46). It would have been obvious for one of ordinary skill in the art at the time the invention was made, concludes the Office Action, to provide raised surfaces within the compartments in the modified apparatus of Wagener, on the basis of suitability for the intended use, because the raised surfaces produce a conical nozzle that supplies a gas flow at faster velocities, following the flow streamlines, and avoids or minimizes recirculating gas cells; the amount of gas used in purging a tube with this configuration is reduced, and the time need for thorough purging is also reduced.

Applicant respectfully traverses this ground of rejection. First, Sharma is concerned with furnaces such as a metal melting furnace, e.g., an electric induction furnace. Although the patentee indicates that the invention has many applications for providing a selected atmosphere within a contained volume, the disclosure of the reference does not extend beyond metal melting furnaces. One skilled in the art, in developing improvements on an apparatus for transferring a microelectronic device to and from a processing chamber and the use of cryogenic fluids in the processing

chamber such as disclosed by Wagener would not look to Sharma or Philipossian for relevant information.

Second, claim 54 recites a pulse jet device. None of the references discloses or suggests such a feature either individually or in combination. As discussed above, simply because device 20 of Wagener supplies a jet of cryogenic particles does not mean that the device is a pulse jet device. Applicant submits that one skilled in the art would not be inclined to substitute a pulse jet device for the aerosol device of Wagener. A pulse jet device would not function in the manner necessary for Wagener's apparatus to work properly because Wagener requires an aerosol spray, not pulsed drops.

Claim 55 is patentable over the combined teachings of Wagener, Sharma and Philipossian by virtue of its dependency from claim 54, which is patentable over the above references as discussed above.

The rejection of claims 57 and 58 is moot in view of the cancelation of those claims.

Claims 59-62 are patentable over the combined teachings of Wagener, Sharma and Philipossian by virtue of their respective dependencies ultimately from claim 54, which is patentable over the above references as discussed above.

Claim 56 was rejected under 35 U.S.C. 103(a) as being unpatentable over Wagener in view of Sharma and Powers, as applied to claim 54 above, and further in view of Vogel. Without acquiescing in the position of the Office Action, Applicant has demonstrated above that claim 54, from which claim 56 depends, is patentable over the combined teaching of Wagener and Sharma. Vogel does not cure the deficiencies of those references and, thus, claim 56 is patentable over the combined teachings of Wagener, Sharma and Vogel by virtue of its dependency from claim 54.

Claims 1-3, 5, 7, 9, 10, 12, 13 and 18-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Gamble, *et al.* (U.S. Patent No. 5,981,733) in view of Sharma. The Office Action acknowledges that Gamble is silent as to the gas outlet port 194 comprising a manifold including at least two compartments, wherein each of said compartments is in fluid communication with a respective gas inlet, wherein a perforated element is in fluid communication with said manifold, and wherein one or more elements for diffusing gas is located within each compartment.

While the Office Action recognizes that Gamble does not teach or suggest the above elements of claim 1, the Office Action refers to Sharma as teaching an

apparatus for dispersing a gas as a multi-layer fluid curtain, wherein the apparatus comprises a manifold including at least two compartments, wherein each of the compartments is in fluid communication with a respective gas inlet. The Office Action further alleges that Sharma discloses a perforated element in fluid communication with the manifold and identifies each of emitting areas 20 and 26 comprising an "opening covered by a porous, permeable or perforated surface," (referring to column 4, lines 17-33 and 47-66, of the reference in support thereof). The Office Action further contends that the perforated element is substantially perpendicular to gas inlets 18 and 24 and refers to emitting area 26 as perpendicular to inlet 24 in FIG. 1. Also, asserts the Office Action, emitting area 20 may be, "oriented to emit the inner layer of fluid parallel to the furnace opening 10," thereby suggesting that the element may also be configured perpendicular to the gas inlet 18.

The Office Action contends that it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute the apparatus for dispersing gas of Sharma for the diffuser 32 in the apparatus of Gamble, on the basis of suitability for the intended use, because the fluid curtain as emitted by the apparatus of Sharma possesses two layers that act cooperatively to stabilize the laminar flow in each layer over a longer distance, thereby extending the effective area of coverage of the layers (referring to column 2, lines 41-50, of the reference). Also, asserts the Office Action, the substitution of known equivalent structures involves only ordinary skill in the art.

First, Sharma is concerned with furnaces such as a metal melting furnace, e.g., an electric induction furnace. Although the patentee indicates that the invention has many applications for providing a selected atmosphere within a contained volume, the disclosure of the reference does not extend beyond metal melting furnaces. One skilled in the art, in developing improvements on an apparatus for the chemical synthesis of molecular arrays as disclosed by Gamble, would not look to Sharma for relevant information.

Second, neither of the references discloses or suggests, either individually or in combination, the feature of claim 1 where the chamber comprises a gas outlet in a wall thereof that is perpendicular to the gas inlets. As a matter of fact, Gamble uses a sealed enclosure (column 3, lines 44-45, and column 8, lines 40-41).

Furthermore, the contention in the Office Action that emitting area 20 may be, "oriented to emit the inner layer of fluid parallel to the furnace opening 10," thereby

suggesting that the element may also be configured perpendicular to the gas inlet 18, is not persuasive. As a matter of fact, Sharma states that inner diffuser 16 may be oriented to emit the inner layer of fluid parallel to the furnace opening 10 or inner diffuser 16 may be oriented to direct the layer into the furnace opening 10 and states further that, in FIG. 1, the porous faces 20 of inner diffusers 16 are oriented to emit fluid layers into the opening 10, and further states that an acute angle of up to 30 degrees into the opening is useful. Such an angle disclosed in the reference is not suggestive of a substantially perpendicular relationship.

Another point is that neither of the references discloses or suggests, either individually or in combination, the features of claim 1 where a perforated element is substantially perpendicular to the gas inlets and where each of the compartments comprises one or more elements for diffusing a gas within said compartment.

Another point is that the substitution of elements asserted in the Office Action goes beyond the mere substitution of one element for another element. One skilled in the art would have to carry out undue experimentation in order to try to operably incorporate the diffuser of Sharma in the apparatus of Gamble. There is nothing in either reference that would assist the skilled artisan in making the substitution asserted in the Office Action.

Claims 2 and 3 depend from claim 1 and, thus, are patentable over the combined teachings of the references by virtue of their respective dependency from claim 1, which is patentable over the references as demonstrated above.

The Office Action asserts, with respect to Claim 5, that, in the modified apparatus proposed in the Office Action, opening 140 is in a wall of the chamber 104 opposite to the perforated element. This assertion contradicts the teaching of Gamble regarding his sealed environment. Furthermore, Applicant points out in the specification that gas flow, which is substantially perpendicular to the wall of the chamber comprising the gas outlet, does not stagnate or recirculate (page 16, last sentence, for example).

Without acquiescing in the position of the Office Action regarding claims 7, 9, 10, 12, 13 and 18-20, these claims depend ultimately from claim 1 and, thus, are patentable over the combined teachings of the references by virtue of their respective dependency from claim 1, which is patentable over the references as demonstrated above.

Conclusion

Claims 1-21, 40-56 and 59-62 satisfy the requirements of 35 U.S.C. §§112, 102 and 103. Claims 57 and 58 were canceled herein. Claims 22-39 were previously canceled without prejudice to Applicant's filing of divisional applications to what has been determined to be the separately patentable subject matter thereof. Allowance of the above-identified patent application, it is submitted, is in order.

Respectfully submitted,



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